



# The TACTICAL LINK



MIDS/Airborne Networking & Integration / Command & Control Program Offices

Volume 3 Issue 1 January 2005

## A Message from PMW 150 Program Manager, Mike Spencer

Welcome to the January 2005 issue of *The Tactical Link* Newsletter. I am honored by this opportunity to address the entire Tactical Link community through this forum. Please allow me to summarize the tactical data link programs I've inherited and how they relate to my responsibilities as the Command and Control Program Manager - PMW 150.

As the Program Manager for the recently established PMW 150, I have the acquisition management responsibility for a range of command and control and tactical data link programs that must be effectively integrated to achieve force level interoperability and provide a true command and control force multiplier. These program management responsibilities range from Global Command and Control System-Maritime (GCCS-M) to tactical data link programs in both Link-16 and Link-22. New capabilities such as Link-16 Joint Range Extension, Link-16 Dynamic Network Management, and Link-22 development efforts are now all within PMW 150 and PMW 780. Additionally, the Program Executive Office, Command, Control, Communications, Computers, and Intelligence (PEO C4I), and Space reorganization has centralized the Next Generation Command and Control Processor (NGC2P), Common Link Integration Processing (CLIP), US MIDS on Ship (MOS), and Joint Interface Control Officer (JICO) Support System (JSS) programs for coordinated implementation/integration on USN ships.

Of significant importance to me is addressing the interoperability challenge. I view interoperability from a command and control perspective as simply getting the right data to the right location at the right time. There are a number of programs in PMW 150 that are on the leading edge of enhancing interoperability. You will be reading about some of these programs and initiatives in this issue, and we look forward to publishing articles on the other programs in future issues. I hope you continue to find this newsletter informative and thought provoking, and along with CAPT Prater, invite feedback on how we can improve the usefulness of the newsletter.



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## Next Generation C2P Implements JRE and Link-22

Contributed by: Bill Reinhardt, Chief Engineer, Galaxy Scientific Corp, San Diego, California

Coming soon to your ship's Tactical Data Link (TDL) capability—the Next Generation Command and Control Processor (NGC2P)! The NGC2P will improve shipboard TDL connectivity, throughput, and communication range through implementation of Joint Range Extension (JRE) and Link-22.

Continued on page 2

## NGC2P - JRE/Link-22 (cont)

### NGC2P

NGC2P is a pre-planned product improvement to the C2P, the re-hosted C2P(R), and the Common Data Link Management System (CDLMS). It is the next generation of systems that have evolved from a 1984 Joint Operational Requirement. Fleet introduction of NGC2P is expected over a five-year period beginning in late FY06.

NGC2P will enable seamless Link-16 operations concurrently with Link-11, Satellite Link-16 (S-TADIL J) and Link-22. Availability of Link-16 message-packing algorithms, Time Slot Reallocation (TSR) and higher data rate Links, such as Joint Range Extension (JRE), will increase the number of tracks that can be shared among units. JRE will also reduce the need for a dedicated airborne Link-16 relay to provide Beyond Line-Of-Sight (BLOS) exchange TDL information.

The flexibility of the NGC2P architecture will accommodate software upgrades for evolving shipboard communications and expanding JRE requirements such as JRE Application Protocol (JREAP) that enhances effective employment of communications and combat resources through distinct IP communications.

### JREAP

JREAP is designed to exploit TDL data transmission over interoperable architectures in compliance with the Department of Defense's Joint Technical Architecture standards. JREAP provides distinct IP communication advantages for the warfighter by providing efficient use of communications and combat resources. The flexibility of this NGC2P JRE processing will allow software upgrades to take advantage of future shipboard communication upgrades and expanding JRE requirements.

NGC2P will support JRE point-to-point SIPRNET IP architectures, JRE multicast IP networks utilizing primarily Extremely High Frequency, Medium Data Rate architectures, and maintain the Ultra High Frequency (UHF) S-TADIL-J architectures. NGC2P will also support Global Command and Control Systems (GCCS) TDL requirements by allowing GCCS to implement JREAP IP connections to the NGC2P or reach out via the JRE architecture to force beyond the local TDL environment.

### Link-22

The US Navy and NATO introduced the NATO Improved Link Eleven (NILE) in the 1980s as a low cost upgrade to the 1960s vintage Link-11 TADIL. NILE evolved into the Link-22 system that incorporates J-family messages. Link-22 is the next-generation NATO TDL system that will provide a secure, reliable, electronic counter-measures resistant, medium speed digital data link to support maritime operations through the exchange of tactical data among ships, submarines, fixed-wing aircraft, helicopters and shore-based units. It is an evolutionary new Link design that will be employed in the exchange and forwarding of tactical data at extended ranges and between multiple networks over a variety of radio frequencies. Link-22 will complement Link-16, providing Extended Line-of-Sight J-series connectivity among Command and Control platforms using modern, robust, relay and routing techniques. Link-22 will ensure interoperability among our non-Link-16 allied/coalition partners that have transitioned from Link-11 to Link-22.

The Link-22 communications system allows many users to contribute to, and access, a real time database of tactical information in a controlled manner. Tactical data may be selectively exchanged among Link-22 units within communities of interest (sub-networks), which are defined by functional requirements.

Each Link-22 unit employs a relay system function that requires no operator action or management. The employment of relay enables the Operational Commander to receive information and direct operations throughout his area of responsibility. Although Link-22 provides a gapless coverage up to a range of 300nm when communicating on high frequency (HF) and 200nm on UHF, relay of information may be utilized to extend the effective range to 1000nm and 300nm, respectively.

### Implementation

The NGC2P Link-22 implementation will enable platforms to accurately process and exchange tactical data with Naval, Joint, NATO and Coalition forces over any combination of TDLs to achieve a Common Tactical Picture (CTP).

***“The NGC2P Link-22 enables platforms to accurately process and exchange tactical data with Naval, Joint, NATO and Coalition forces over any combination of TDLs to achieve a Common Tactical Picture”***

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## Link-22 (cont)

NGC2P is a key enabler for information and decision superiority. Figure 1 depicts the NGC2P supporting the mission of Naval C4ISR, including Command, Control, and Information Superiority.

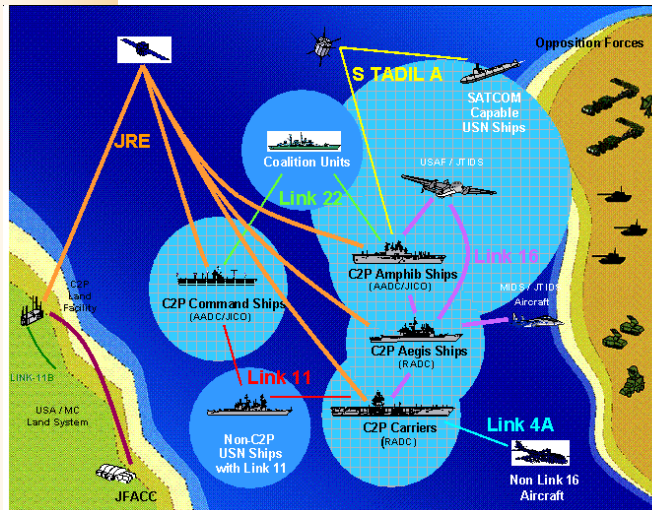


Figure 1. NGC2P High-level Operational Concept

NGC2P expands the functionality of the existing C2P/CDLMS to:

- (1) Enhance C2 connectivity and interoperability among Joint Force units
- (2) Process and exchange the tactical data necessary to establish and maintain CTP
- (3) Maximize use of available bandwidth
- (4) Support direct reach to Joint Force Commanders and forward deployed Forces
- (5) Support limited GCCS access to local TDLs

Together, these capabilities will improve the warfighting effectiveness of the Navy and Joint Force across the full spectrum of conflict.

### Program Objectives

The primary objective of the program is to extend the range-limited tactical networks to BLOS while reducing the dependency of relay platforms. Since the current tactical links are limited by both the number of participants supported and the amount of data throughput, another objective is to off-load the stress put on these networks to allow them to concentrate on higher priority tasking, while also providing backup communications in the event of the loss of normal connectivity as shown in Figure 2.

The final benefit is to provide the non-tactical data link platforms with a means of communications and situational awareness. JREAP will enhance and augment the current and future military communications infrastructure by improving theater-wide communications, as well as out-of-theater JRE Reach Back. Link-22 will expand the HF waveform capability and exploit modern network management and routing to compliment Link-16 and JRE. JREAP and Link-22 improve interoperability and information sharing of the J message family — critical to achieving information superiority.

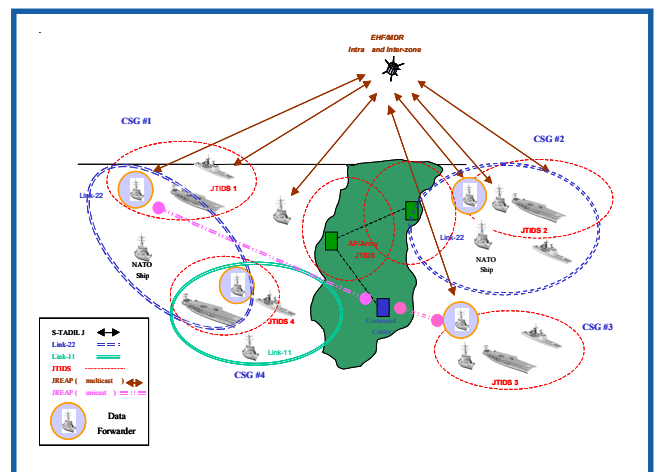


Figure 2. Navy Theater Concepts

# JSS - Managing Multi-Tactical Data Link Networks

Contributed by: 1<sup>st</sup> Lt Jaylene Vottero, JSS Program Manager, Hanscom AFB, Massachusetts

## JSS in Review

- *Automated, network centric tool set and information repository*
- *Supports JICO to plan, manage and execute MTN/MTA*
- *Consist of a baseline of common modular hardware, software, documentation, training and JDRs*
- *Production units are scheduled for delivery in 2007*

Complex systems complicate management! Tactical Data Links (TDLs) are complicated, and have becoming increasingly so since their introduction in the 1950s. Current TDL management requires highly skilled individuals supported by automated management tools. The current state-of-the-art is the Joint Interface Control Officer (JICO) Support System (JSS), a concept developed and defined through more than a decade of TDL management experience. The JSS has become an official joint program with a Joint Requirements Oversight Council-approved Operation Requirements Document, with the Air Force appointed as its Executive Agency.

The JSS is an automated, network centric tool set, and information repository to support the JICO in the planning, management and execution of the multi-TDL network/multi-TDL architecture (MTN/MTA), and the data flowing through it, including allied and/or coalition entities as appropriate. The MTA is the physical configuration, functional organization, and operational procedures used in the design, establishment, modification, and operation of the MTN. The MTN is a primary contributor to the Joint Data Network's (JDN's) production of the Common Tactical Picture, which enhances the Joint Force Commander's ability to wage war. The officer responsible for the planning and management of the MTN portion of the JDN is the JICO.

The Joint Interface Control Cell (JICC) is a task-organized team of multi-TDL-experienced personnel that supports the JICO. The JICC consists of a JICC Officer in Charge, Watch Officer, TDL managers and track data coordinators necessary to support continuous Joint MTA/MTN planning and management. JSS will provide the functionality to allow the JICC to perform all

required tasks, and all JSSs have the same level of functionality. JSS will be flexible and scalable with regard to those voice and data communications systems allowing for the highest level of required functionality. Adaptive packages will allow for either; a deployable, self-contained, Full Expeditionary Capability, or a Common Core Capability in which the operational facility's (OPFAC) communications systems are used to the maximum extent possible. JSS shall consist of a baseline of common modular hardware, software, computer operating system, documentation, training, and both local and remote JICO Data Repositories. JSS shall be located in those OPFACs, in which the responsible service believes it will most likely be called upon to execute the Joint, Regional and Sector Interface Control Officer roles. In either configuration, the JSS will have a distinct presence in the MTN. Distinct presence is defined as an active data link participant (interface unit) on the MTN separate and distinct from a host OPFAC.

The JSS acquisition is a two-phased approach. Phase 1 is the development/demonstration phase, which ends in May 05, and consists of three contractors teams led by General Dynamics, Northrop Grumman, and Lockheed Martin. Phase 2 is planned to start in May 2005 and will consist of one contractor to continue the development and production of JSS. The first engineering development models are scheduled for delivery in November 2005, and the production units are scheduled for delivery in 2007. The duration of the JSS Program contract will be from FY04 to FY09. The service programmed funding responsibilities for the JSS Program will be shared between the Air Force, Navy, Army, and Marine Corps for development and common sustainment.



## JSS Related Requirements Documents

*Chief of Staff Manual (CJCSM 3115.01A) "Joint Data Network Operations"*

*Tactics, Techniques, and Procedures (CJCSM 6120.01) Joint Multi-Tactical Data Link Operating Procedures*

## Who's the BOSS?

Contributed by: Captain Doug "Crack" Creviston, 48<sup>th</sup> FW, RAF Lakenheath, United Kingdom

### ***BOSS -A Dynamic and Robust Training Tool:***

- ***Improves realism and effectiveness***
- ***Provides an excellent capability to train for TST***
- ***Enhances user interface to support the RTO with real-time "Kill" features***
- ***Emulates a "God's eye view" of the battlespace***

In May 2004, the 48<sup>th</sup> Fighter Wing (FW) at RAF Lakenheath, UK took ownership of their tactical data link (TDL) ground-based training system, known as the Battlefield Operational Support System (BOSS), with incredible potential for lively Link-16 training and post mission debriefing and analysis. The BOSS offers our three F-15 squadrons a dynamic and robust capability to improve the realism and effectiveness of our daily combat training, all without the requirement to carry an external pod. The embedded simulation engine provides the capability to generate "virtual" assets, such as AWACS, JSTARS, and other Command and Control, Communications, Computers, Intelligence, Space, Surveillance and Reconnaissance (C4ISR) systems, which are otherwise unavailable for training on a routine basis. The BOSS sends tasking, targets and threat messages to the net participants and provides an excellent capability to train for Time-Sensitive Targeting (TST), which we did not previously have. We also have the option to add imagery transfer via the BOSS using the J16.0 message. This capability will come in very handy when we receive the F-15E Suite 5 software upgrade that puts imagery in the cockpit.

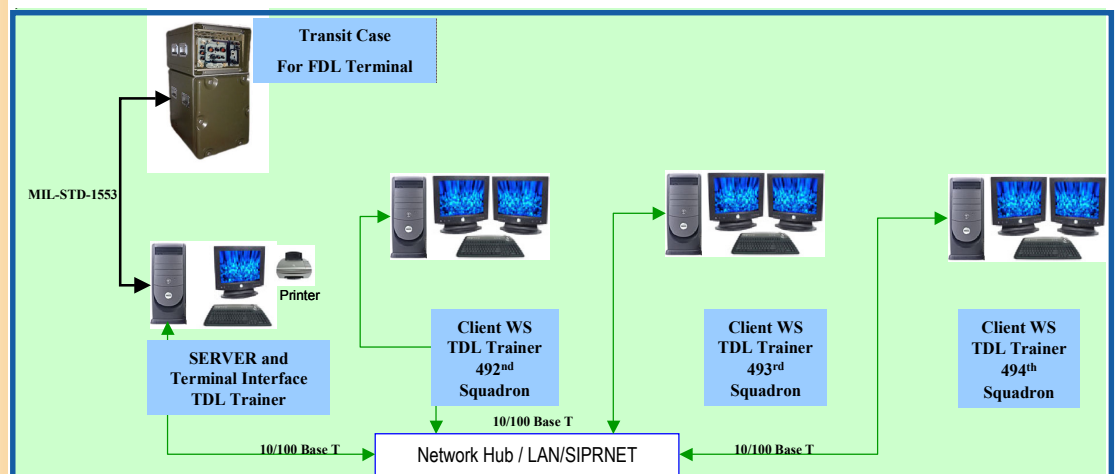
The user interface has been enhanced to support the Range Training Officer (RTO) with real-time Kill Assessment and Kill Removal features. The ability to calculate and display bearing, range and aspect angle from the "shooter" to the "target," is necessary for the RTO to accurately evaluate the Probability of Kill. The F-15 cockpit Situational Awareness (SIT) display provides the RTO with

an emulation of the aircrew's view of the battlespace. The potential for a "God's eye view" of all link participants by leadership and the Supervisor of Flying (SOF) will enhance Command and Control (C2) and Range Safety during day-to-day operations.

Depicted below, the configuration of the BOSS, developed by Tactical Communications Group, LLC, consists of a server, three remote client workstations and a terminal mounting rack for the Fighter Data Link (FDL) terminal. The server is connected to each of the workstations via a secure Ethernet and to the FDL terminal via a 1553B bus interface. This allows each of the three squadrons (492<sup>nd</sup>, 493<sup>rd</sup> and 494<sup>th</sup>) to share a common terminal asset for live network participation and to monitor the other two squadrons training activities. Our workstations allow for live interaction with net participants and real-time display of the overall network traffic and of any selected F-15's SIT display. They also each have an embedded simulation engine, and a Data Extraction and Reduction Guide (DERG) recording and playback capability for pre- and post-mission actions. Scenarios can be generated off-line for use during training exercises or dynamically generated/modified in real-time while actually participating in the net.

The DERG recording and playback feature improves post-mission debrief actions by providing for large screen display and "Fast-Forward/Reverse" viewing any time during the recorded exercise. In addition, the robust filter

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## BOSS (cont)

*“BOSS will enable RTO operations with the added benefit of recording the Link-16 picture of the battlespace for debrief purposes.”*

capability allows the user to select; a specific event or time, track number, or message type for review and analysis.

The BOSS provides incredible potential for increasing the effectiveness of our training, and could have applications in combat operations as well. Here are some considerations for those interested in implementing a similar system:

- Recommend using laptops for workstations. This will increase the ability to deploy the BOSS with a geographically separated unit or to make a view of the Link-16 picture available to the command element or SOF. For server use, desktops and laptops were found functionally comparable.
- Examine the governing FCA and apply for the necessary waivers to operate in both transmit and receive mode.
- Push for accreditation to use BOSS on the SIPRNET. This will greatly increase the flexibility of your operations by allowing a workstation to be set up anywhere a SIPR drop is available. This capability is the key to a successful operation.

The 48<sup>th</sup> FW is the proud owner of the first TDL ground-based training system in the Combat Air Forces. The BOSS offers incredible potential for simulating C2 assets like JSTARS and AWACS, filling a void in our training. Without the requirement for extra hardware, BOSS will enable RTO operations with the added benefit of recording the Link-16 picture of the battlespace for debrief purposes. The experience of the 48<sup>th</sup> FW is offered for prospective users to use in their planning. The BOSS is at the leading edge of the evolving, revolutionary Link-16 capability. From enabling effective training for net-centric warfare by simulating C2 assets to improving our air-to-air training with an RTO capability, the BOSS is a training tool the combat forces of the United States could benefit from.



## TACTICAL LINK UPCOMING EVENTS

Armed Forces Communications and Electronics Association (AFCEA) West Conference	1-3 Feb	San Diego, California
MIDS Technical Working Group (TWG #17)	28 Feb-4 Mar	Wayne, New Jersey
Multi-Link Users Conference	1-3 Mar	San Diego, California
Mission Planning Users Conference	13-18 Apr	Las Vegas, Nevada
Implementation and Interoperability Working Group (I&IWG)	12-14 Apr	Cologne, Germany
Military Data Links Conference	20-21 Apr	San Diego, California



## Tactical Data Links – Ballistic Missile Defense’s Most Important “Weapon”

Contributed by: CDR Ted Huskey, PEO C4I & Space Missile Defense/Joint and Allied Systems Implementation Lead, San Diego, California

The attacks of September 11, 2001 mobilized our nation’s resources against a new enemy – terrorism. The savage attacks did more than reveal the length our enemies would go to attack us; they forced us to rethink our understanding of future conflict. The National Missile Defense Act of 1999 called for the development of a National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack and in December of 2002 the National Security Presidential Directive (NSPD-23) was signed to revitalize our efforts and expand the area of concern beyond our national boundaries.

Developing and deploying a Ballistic Missile Defense System (BMDS) is a monumental undertaking that involves all the armed services and numerous national agencies. The Missile Defense Agency (MDA) is leading the effort with AEGIS BMD as the Navy’s lead.

The BMDS is a system in every sense of the word, comprised of terrestrial, space and sea based assets. The system is far from complete, but as it matures, so will the capabilities of all the services. Today, AEGIS cruisers and destroyers continue training and exercising as part the BMDS but in the very near future we will deploy fully integrated interceptor equipped AEGIS cruisers.

Missile Defense is tough. Intercepting a supersonic missile with a missile, a bullet with a bullet, is mind-boggling. Earlier this year, the darkness of the Pacific night was momentarily illuminated by the result of a perfect missile intercept test event. The intercept was one in a string of successful test engagements the Navy has been conducting in response to NSPD-23. The significance and complexity of the event is a testament to system engineering. The hero of these engagements is the *Tactical Data Links*.

Dissemination of missile track data is vital to the effectiveness of the BMDS. Unlike other missions where track data is locally consumed, ballistic

missile track data is relevant outside the theater of operations. Information, specifically tactically relevant track data in “J series” message format, is the most important link in the BMDS. The SPY-1 radar data of a forward deployed AEGIS destroyer or cruiser is MDA’s most vigilant sentry continually searching the skies for tracks of interest. When a qualified space track is detected, AEGIS sends that information to the BMDS via satellite TADIL-J (STJ), the Navy’s Beyond Line of Sight (BLOS) Link-16. STJ is the Navy’s BLOS communication path and has been in use for over a decade. Ensuring these BLOS data links are

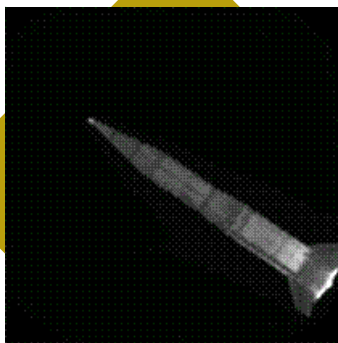
at their very best is accomplished on two fronts; optimization of existing software and hardware suites and rigorous testing.

Missile defense is a complicated mission. Execution of this mission will be a marathon rather than a sprint. The BMDS is complex and spread across the globe. Rushed or poorly coordinated technology

infusion could reduce its effectiveness. To ensure these new capabilities and technologies are incorporated smartly, AEGIS BMD uses two-year “Blocks” concept where capabilities are planned out over the next 12-16 years and introduced as they mature.

Regardless of the communication path, the timely exchange of space track data will always be a top operational priority and essential to this mission’s success. As we continue to optimize STJ, we are also preparing to field its successor, the Joint Range Extension Application Protocol (JREAP).

Be it STJ today, JREAP tomorrow, or the Global Information Grid (GIG) in the near future; timely, reliable and robust exchange of space track data is the best tool in the BMDS’ arsenal. The lessons being learned in the lab and during BMD test events utilizing STJ today are helping shape our development and fielding of future data links in support of this vital mission for tomorrow.



***“Missile Defense is tough. Intercepting a supersonic missile with a missile, a bullet with a bullet.....The hero of these engagements is Tactical Data Links”***

# Follow the Road to a Combat Ready MIDS Squadron

Contributed by: LT Mark “Fun” Mhley, Strike Fighter Weapons School Atlantic, NAS Oceana, Virginia

At this summer’s MIDS Maturity Review in La Jolla, California, LCDR Matt “Cassius” Clay and LT Mark “Fun” Mhley presented a “Roadmap to a Combat Ready MIDS Squadron.” The end of the road is marked by a squadron that is seamlessly integrated into a joint daily training and Homeland Defense network that exercises Navy and Joint Link-16 Tactics, Techniques, and Procedures (TTPs) in preparation for distant theater operations. Along the way are few key milestones. Below is the “ideal” path from a Navy perspective, which both the USN and USAF are working to make reality.

## *Squadron Standup*

- 1) Introduce overall system complexities to squadron maintainers. Develop relationships between squadron and intermediate level maintenance.
- 2) Modify squadron aircraft with a Multifunctional Information Distribution System (MIDS) terminal. With Link-16 fully integrated in every aircraft, missions can be performed without combining MIDS and non-MIDS aircraft and without tactical workarounds.

## *Training*

- 3) Build a Link-16 daily training network to support needs of the local military community. This replicates networks found in operational theaters, allowing every joint and allied Link-16 platform to participate. Instead of a formal OPTASK Link message, a simple deconfliction plan can parse out J-unit numbers, channels, and other planning factors.
- 4) Establish a local ground-based Network Time Reference (NTR) in a secure location. The NTR hosting facility loads the daily training network and daily crypto to synchronize all local platforms.
- 5) Define a Navy crypto management process, ensuring that a correct crypto gets to the unit that needs it as soon as possible. This process accepts requests for any service-specific, joint, or allied crypto and processes those requests for the user. It knows what crypto is being used in which networks and where, and pre-positions crypto when appropriate
- 6) Revisit the MIDS squadrons by a knowledgeable technical representative. Complete

the revisit a few months after the initial MIDS installation and during the first week of that squadron’s first boat detachment. This revisit ensures there are no unreported issues, and ensures the squadron is able to integrate into the Carrier Strike Group’s Link-16 architecture.

## *CONOPS*

- 7) Develop a Concept of Operations (CONOPS) to explain how Link-16 supports different mission areas. Navy TTPs are also developed to teach aircrew how Link-16 is used in the cockpit to assist and fulfill mission duties.

- 8) Create an OPTASK Link message for the local area, enveloping the Navy, joint, and allied data link needs in that network. This message replaces or augments the simpler deconfliction plan from the Wing Manager.

- 9) Train alongside. F/A-18 MIDS squadrons train alongside other USN Link-16 platforms in a CONUS data link playground. Playgrounds allows aircrew to train with Navy TTPs and see what track information other platforms contribute to a theater sized network.

## *Joint Operations*

- 10) Build a Joint CONOPS for joint theaters with Joint TTPs so that dissimilar platforms with different software implementations can accomplish the same tasking.

- 11) Train jointly in a Link-16 playground, allowing all platforms to train with the Joint CONOPS and TTPs, in addition to seeing track information from those platforms.

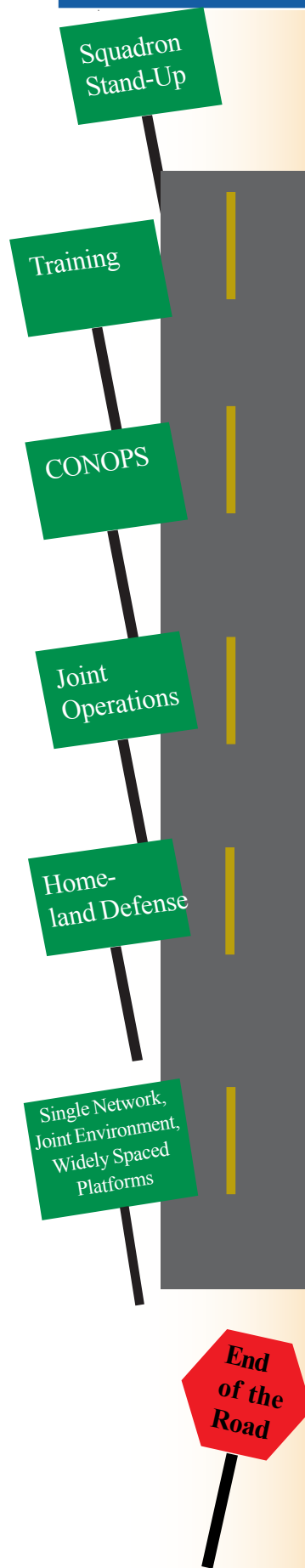
## *Homeland Defense*

- 12) Develop a Maritime Homeland Defense doctrine, explaining how Navy assets are to be used during a Homeland Defense crisis, and how they will use Link-16 to support that tasking.

- 13) Incorporate Homeland Defense doctrine into a Joint Homeland Defense doctrine, where it is made clear how Air Force, Army, and Navy Link-16 assets will be used in time of crisis.

- 14) Create a single continental US network for both daily training and Homeland Defense usage. Include an appropriate number of each platform type so that the network could be used across a wide expanse of this nation at any one time. Build

*Continued on page 9*



*For the USN's "real world" findings on the "ideal" milestones, contact LT Mhley at: mark.mhley@navy.mil*

## Roadmap (cont)

the network with External Time Reference (ETR) in mind, which allows multiple ground stations to simultaneously synchronize widely spaced Link-16 platforms using GPS ZULU time.

15) Manage the daily interoperability issues involved with a common, daily training, and Homeland Defense network. This is done by both the ground stations that act as ETR (managing the connectivity and platform data exchange requirements) and the USN and USAF wing managers (managing the tactical issues). The Air Defense Sectors (ADS) maintain oversight of the Link-16 network.

With all the steps in place, one can envision a real life scenario; an F/A-18 is launched from NAS

Oceana in the daily training / Homeland Defense network and has situational awareness to Link-16 Precise Participant Locations and Identifications (PPLIs) and air tracks between him and his working areas. He can perform his air intercept training mission using track information from an AWACS tasked to a Homeland Defense mission. An F-15C can use the same network as part of that Homeland Defense mission, his PPLI monitored by the ADS, allowing his aircraft to be tasked to perform a critical mission. Both aircraft will be able to fully exercise MIDS in a robust, joint environment that has the look and feel of a theater a half a world away. **End of the road**

## Going on WESTPAC? Are you Prepared?

*Contributed by: LT Scott Sanders, COMCARSTRKGRU FIVE /CTF 70 JICO, Yokosuka Japan*

The Seventh Fleet Area of Responsibility (AOR) is quickly evolving into the theater that WESTPAC carrier and expeditionary strike groups will deploy to in support of the Fleet Response Plan (FRP). In order to maintain the agility the FRP requires, we constantly conduct tactical data link operations with joint and bilateral forces. The learning curve is steep as there are many Tactical, Training and Planning (TTP) issues, and the capabilities of our joint and bilateral units are always changing.

State-side, strike groups operate under different guidance than they do over here in Yokosuka, Japan. Neither better nor worse, this difference is manifested as a hurdle to seamless operations. Through planning, communication and familiarization with a few tools, strike groups can deploy or transit through the C7F AOR with the situational awareness they require.

1. The first step in preparing for operations in this AOR is contacting LT Tom Felten, the C7F JICO, and myself *well before* your strike group arrives. That gives everyone time to identify problems and test and implement solutions.

2. Next, be familiar with the JTIDS networks, to include where and when contention and dedicated access can be used.

3. Finally, because strike groups routinely deploy to or transit through the C7F AOR, sustained effort is required to provide quality support. That effort generates lessons learned that are incorporated into the C7F and CTF-70 Collaboration at Sea (CAS) SIPRNET websites.

So, when you are faced with a challenge, make these collaboration tools your first choice. Ultimately, it will improve our mission and our community.

The ultimate goal, of course, is to enable strike groups to quickly transition to contingency phase operations anywhere and anytime they are in the C7F AOR. Through planning, communication and using the tools we have available, every strike group will have the complete, timely and accurate picture they need to reach that goal.

***If you still find yourself faced with a challenge, contact us and make it our challenge too.***



**LT Scott Sanders at:**  
**cg5n63@kitty-hawk.navy.mil**  
**or**

**LT Tom Felten at:**  
**n312@c7f.navy.mil**

# USN Moves Forward with Dynamic Network Management

Contributed by: Kelly Sobon & Kevin Rine, Network Products, PEO C4I & Space, PMW 150, San Diego, California

***“TSR will increase network efficiency, and reduce network planning and initialization complexity for USN C2 platforms”***

Link-16 is the primary tactical data link for our warfighters today. There is an increased demand on the Link-16 networks because of new applications and platform requirements. As the number of Link-16 platforms and applications continue to grow, the ability to access Link-16 network capacity will become increasingly stressed.

Today, Link-16 networks are mostly static. Because capacity is not reallocated dynamically, network use is frequently inefficient, as capacity goes unused when not needed by a particular platform at a particular time. Dynamic network protocols and technologies increase Link-16

efficiency and flexibility, supporting the increased demand on Link-16 networks. PMW 150 is leading the USN, in moving ahead with these dynamic network protocols and technologies.

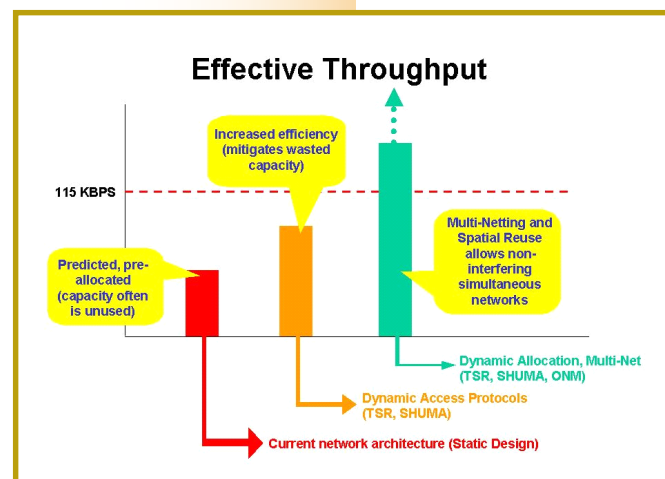
The first dynamic capability the USN is fielding is Time Slot

Reallocation (TSR). TSR is a dynamic reservation access protocol that dynamically reassigns Link-16 capacity based on the needs of the network participants. TSR was invented during the early development of the JTIDS, and the TSR protocol algorithm has been implemented in most JTIDS and MIDS terminals. TSR fielding has been delayed because TSR requires both a terminal algorithm to reallocate time slots and a host demand algorithm that enables each platform to broadcast their requirement. The US and NATO have developed and approved a Host Demand Algorithm that ensures each platform requests capacity fairly. The USN has successfully tested TSR operations in both the USS Stennis Carrier Strike Group (CSG) and USS Reagan CSG underway periods, and is now moving ahead with the fielding of TSR. Link-16 equipped surface platforms will be fully TSR operationally capable

by next summer. Full USN Command and Control (C2) platform implementation (ships and E-2Cs) will follow by December 2005. TSR will increase network efficiency, and reduce network planning and initialization complexity for USN C2 platforms.

The Link-16 message structure also supports dynamic network management. PMW 150 has been actively testing Link-16 network management message sets and protocols to ensure platforms are able to accept over-the-air network management (ONM) messages and correctly respond to over-the-air network changes. The use of the network management messages was successfully tested with ships and E-2C aircraft with the USS Stennis CSG during their COMPTUEX in 2003 and with F-14Ds at the Naval Air Warfare Center-Pt. Mugu. Each test successfully demonstrated ONM's capability to support dynamic network entrants and capacity augmentation. Further testing is on-going with F/A-18s at the Naval Air Warfare Center-China Lake to support operational considerations for employing an ONM capability. ONM will significantly increase Link-16 throughput, enabling greater use of network spatial reuse and multi-netting for high-bandwidth needline applications such as imagery, sensor networking, remote targeting, weapons networking. The Link-16 ONM capability will be initially fielded in the Joint Interface Control Officer (JICO) Support System (JSS), providing the JICOs and Link-16 operators a valuable tool in ensuring the Link-16 networks meet their operational needs as requirements evolve during deployment.

PMW 150 and PMW 780 have also teamed with the Office of Naval Research and SPAWAR Systems Center San Diego to investigate and develop other dynamic networking capabilities. Other initiatives being pursued and tested under the Dynamic Network Management program are the Stochastic Unified Multiple Access (SHUMA) protocol and an expanded TSR capability to support full dynamic entry and exit for C2 platforms. PMW 150 is also actively pursuing technologies that expand the Link-16 networks application of multi-netting in a dynamic environment.



***“ONM will significantly increase Link-16 throughput, enabling greater use of network spatial reuse and multi-netting for high-bandwidth needline applications...”***

## IDLS04 Scores Top Marks

*Contributed by: Emma Jane Taylor, IDLSoc Communication Secretary, United Kingdom*



The International Data Link Symposium 2004 (IDLS04), the premier event of the International Data Link Society, took place in San Diego, California

from 19-21 October 2004 and was hailed a great success.

The overriding memory will be the downpour that arrived in San Diego just as we were setting up for the symposium and continued for most



of the event. However, the challenges of the San Diego monsoon did not dampen the spirits of the organizers or delegates.

Mr. Dennis Bauman, PEO C4I and Space, Air Vice Marshal Stephen Dalton RAF and Group Captain Michael Walkington RAN gave the opening speeches. They laid the foundation of the symposium, while setting a few challenges. In all, 646 delegates from around the world attended. There were delegates from Japan, Austria, Sweden, Finland, and Switzerland as well Australia, New Zealand, and the NATO countries.

There were 14 forums held over the 3-day event covering topics as diverse as TDL Update program, MIDS to JTRS Transformation and Data Links in support of Ballistic Missile Defense to name but a few. A new addition was the Chairman's forum where the chairs from the various data link groups (including JICRB, I&IWG, NILE SG, EJCC and MNWG) each gave a brief of their recent work and their roles and responsibilities. The goal is for the working groups to continue their discussions and actions throughout the upcoming year to enable better discussions and assign actions in preparation for next years' IDLS.



The exhibition hall was full of exhibits from the leading companies in the international data links community.

For the first time at an IDLS event, nearly all the MIDS terminal suppliers were represented, which gave the users a great opportunity to speak with them and compare ideas.

Fortunately, it wasn't all work. IDLS04 arranged for several special events for the attendees. The IDLSoc Annual Charity Golf day, sponsored by Aerosystems International, was held on 18 October. Over 60 delegates played golf and raised \$3000 for local and international charities. The proceeds will be divided between the following:

- Braille Institute
- Alzheimer's Association
- Navy/Marine Corps Relief Society

Thales sponsored a lively Cocktail party on board the Berkley Maritime Museum (an old steam ferry) on Tuesday night. Along side the steamer was the sailing ship used in the film "Master and Commander," which guests were able to tour. Ah Hollywood, the cannons were fiberglass!

Northrop Grumman, who was the main sponsor of IDLS04, arranged a spectacular symposium dinner for the final night. Dinner was served aboard San Diego's newest floating museum, the USS Midway, with drinks on the flight desk and food from around the world. Dining on the USS Midway was a grand way to finish an exhausting but exhilarating symposium. Admiral Sharp's pre-dinner speech resulted in a very lively debate at most tables between Industry and the Customer, and set the scene for IDLS05 in Sydney, Australia.



*See you next year!*

*Persons wishing to become an IDLSoc member may do so by visiting the Society's website at:*

<http://www.idlsoc.com>



**IDLS05  
Sydney, Australia,  
4-7 October 2005**

## TADL TAILS

*The FRP gives deployments a "presence with a purpose"*

**For Tactical Link distribution, article submittal or information, contact: [tac.link@navy.mil](mailto:tac.link@navy.mil)**

# The FRP - A Deployment Concept Friendly to Families

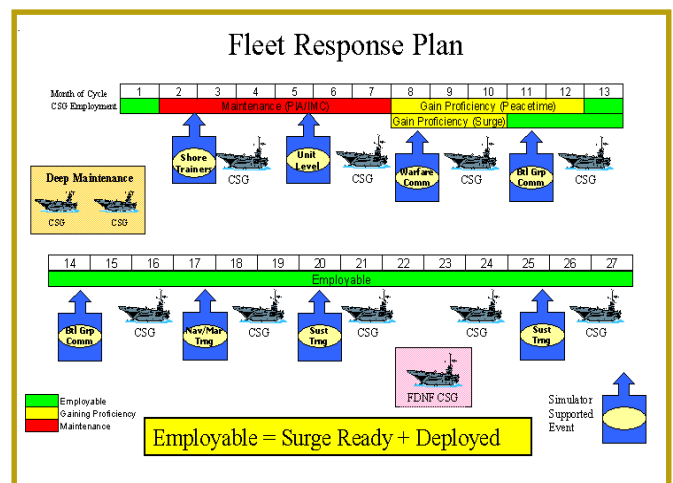
What is FRP you ask? The Fleet Response Plan ,or FRP is in simple terms is a new deployment concept that allows our forces to be more ready, more flexible, and provide more options for the nation to deal with the threats of today and tomorrow. It combines training and maintenance schedules, manning requirements, equipment and funding to make six carrier strike groups available to our national leadership within 30 days, with two more available within 90 days in times of war or significant crises.

But what does it mean to you and your families? Quite frankly, it means a little less predictability and in war or crisis, it means deployments will be made to meet the mission. Being ready to answer the call and remaining on station for as long as needed are options we have always provided to our national leaders due to the unpredictability of wartime and contingency operations. But it also means that during other times, deployments might be less than six months long like the recent USS Stennis Carrier Strike Group deployment which only needed five months to meet the mission. Or it could mean a deployment will be cancelled, as in the case of the USS Saipan Expeditionary Strike Group deployment, which was scheduled for August 17<sup>th</sup> of last year, but was cancelled because it was no longer needed at that time.

Yes, this may take some predictability out of our life on the waterfront, but that is what the nation requires in these uncertain times. The risk to America is real and the need to defend our nation and our way of life are also very real.

As a Chief Naval Officer put it recently, "the net result of the FRP is a Fleet that is more ready, with more combat power — more quickly — than was possible in the past."

While FRP is necessary to meet the needs of this new uncertain world, we will not meet those needs on the backs of our Sailors. We will respond when needed, but not deploy for the sake of a cruise. FRP will require us to be more ready and more flexible yet, we will ensure the quality of life and service is maintained for you and your families.



Sample FRP

## The TACTICAL LINK

Navy Airborne Networking Program Manager.....CAPT David Prater  
Deputy Program Manager.....CAPT Steve Desjardins  
Navy Command and Control Program Manager.....Mr. Mike Spencer  
Deputy Program Manager.....Mr. Brian Scurry  
USAF Tactical Data Networks Program Director.....LtCol Tony Cervený  
The Tactical Link Editor.....Mr. Rick Lindsay